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IX. *A Letter from Mr. William Sharp, Surgeon to St. Bartholomew's Hospital, to James Parsons, M. D. F. R. S. containing an Account of a new-invented Instrument for fractured Legs.*

S I R,

Read Feb. 12, 1767. **A**S the following treatment of fractured legs (from the experience I have had of its success during a practice of several years) appears to me preferable to any I have hitherto known, and as it may be a means of lessening many of the inconveniences attending such accidents, I take the liberty of sending it for your opinion; and, if you think it of consequence enough to be made public, shall be glad to have it laid before the Royal Society.

The instrument here recommended was first applied with great success in an oblique fracture of the tibia (which could not be kept in a proper situation by the usual methods), and afterwards, as happily, in a dislocation of the lower extremity of the same bone, accompanied with a fracture of the fibula. In this latter case, it is often difficult to reduce the dislocation even with a strong extension, and more so to retain the bones in their proper situation, while the limb is laid in the usual extended posture. But both these difficulties are absolutely avoided by the means I am about to describe.

The

The remarkable good effects in the cases above-mentioned, induced me to try the same in different fractures of the leg, as well compound as simple; in all which I have found it to answer my expectation.

I have formerly explained this method of treating fractures to many gentlemen of the profession, as well as to yourself; and have also had several cases where other surgeons have been concerned with me, who have in general expressed great satisfaction (and some of them have introduced it into their own practice); so that I have reason to believe it would have become more general, if the instruments, that have hitherto been sold for that purpose had been made according to the original pattern; but the workman, whom I employed, has made and sold many that differ from mine in some essential points. I have therefore thought it necessary to send you, inclosed, a description of the instrument, made after such a manner as I have found by experience to succeed best.

I am, with great esteem,

S I R,

Your most obedient, and

most humble servant,

Mincing-Lane,
Nov. 10, 1766.

W. Sharp.

Description of a new invented Instrument for fractured Legs, (consisting of two Parts, which at present I shall call upper and under splints) recommended to be used instead of the common Apparatus. (See the Plate.)

THE figures are drawn on a scale of three inches to a foot, and represent two splints of strong pasteboard, made with glew, to be fastened upon a fractured leg, by three straps which surround the whole.

These are adapted to the leg of a middle-sized man; nevertheless it may be convenient to have two other sizes, the one about twenty two inches in length, and the other sixteen.

TAB. V. Fig. I. A represents an under splint of an irregular form, suitable to that part of the leg it is intended to cover; it is a little convex externally, and concave internally. The length eighteen inches, from *a* to *b*. The width two inches and three quarters, at the strap near the knee, and two inches and a quarter at both the other straps.

BBB. Three leather straps from fifteen to twenty inches long, and one inch wide, having two rows of holes so placed that every hole in each row may be opposite to a space in the other. These must be sewed fast to the middle and outside of the under splint. The portions of straps *d d d* on the anterieur
part

Fig. 5.

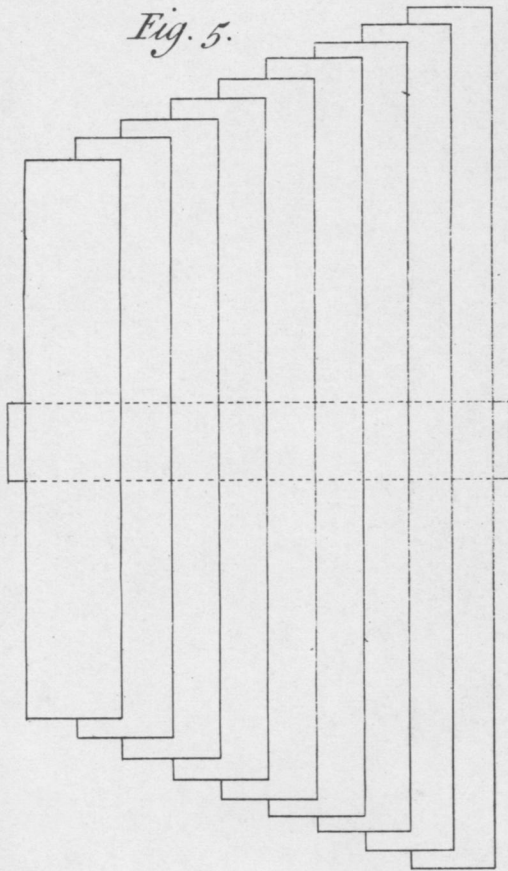


Fig. 4.

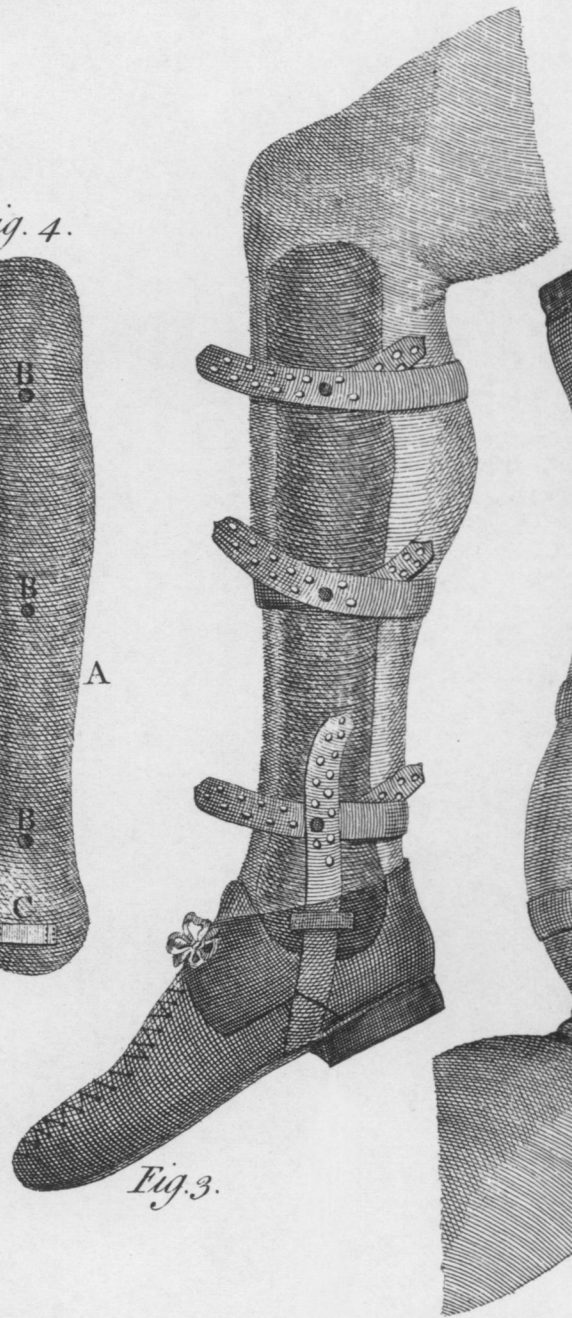
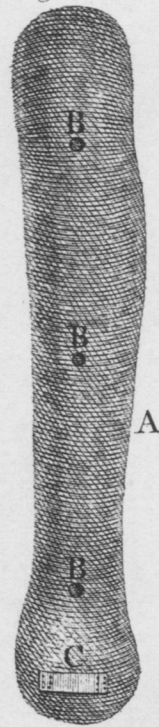
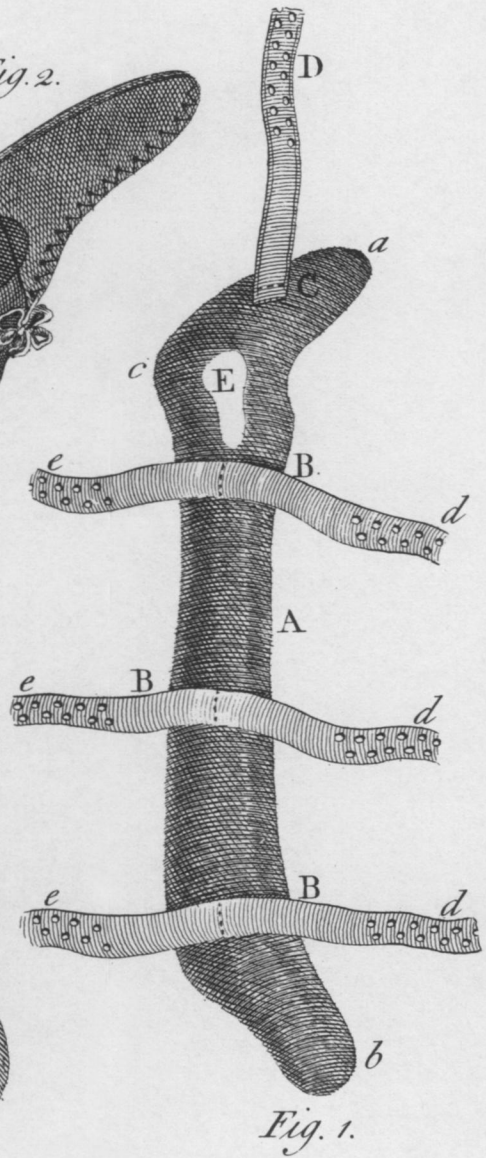
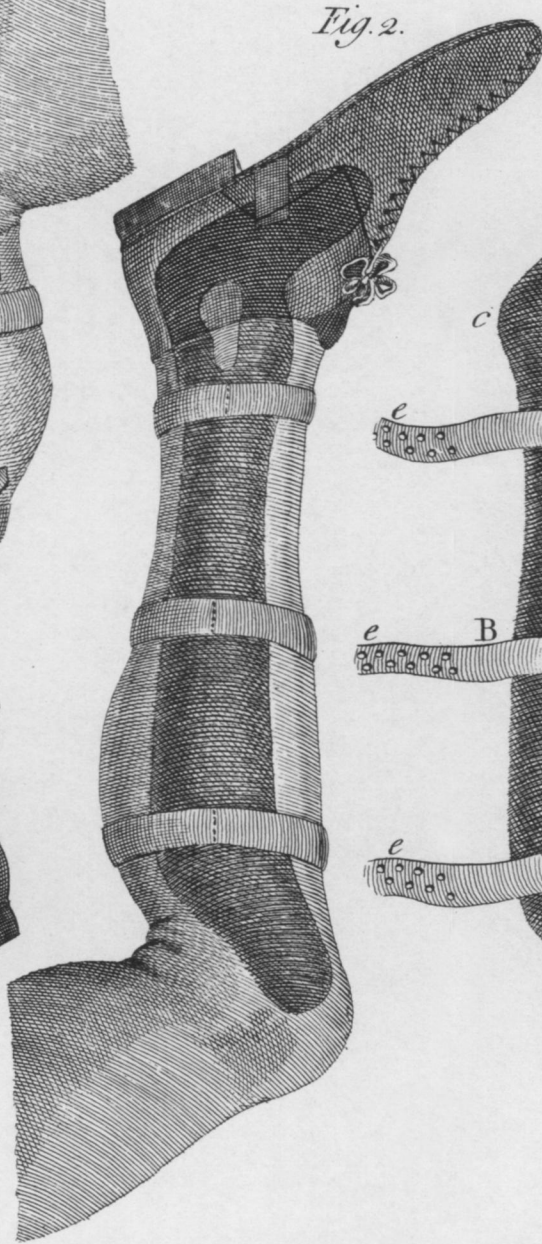
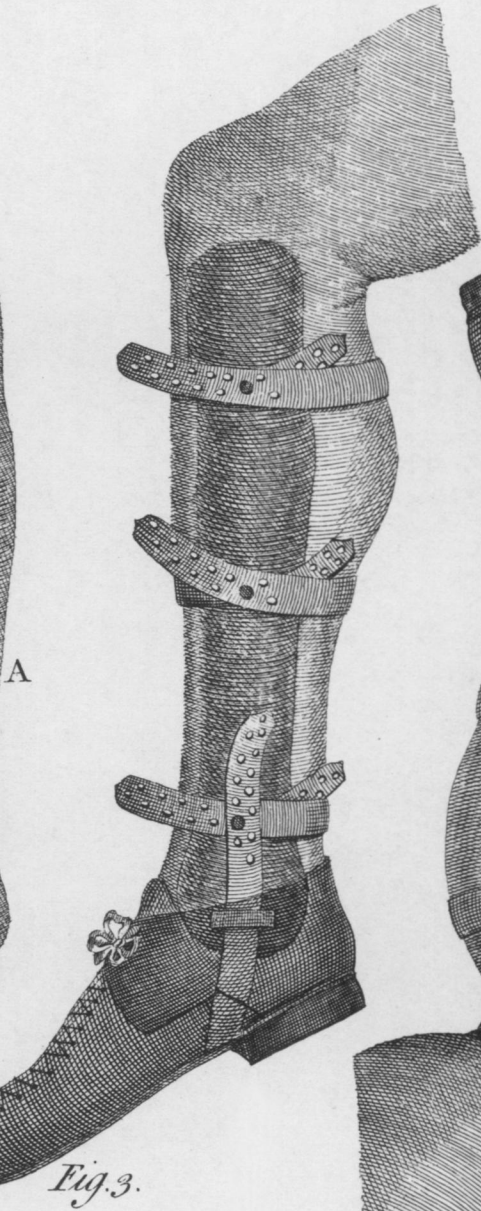


Fig. 3.



part of the splint, must be shorter than those on the posterior *e e e*, which are to surround the more muscular part of the leg.

C. A part to support the foot, from the point *a* to the heel *c*, five inches long, at an angle of sixty degrees.

D. The foot-strap, twelve inches long, sewed to the bottom of the under splint, within two inches of the point, to pass under the heel and through the leather loop on the upper splint, to the lowest pin.

E. An irregular oval hole, two inches long and almost one wide in the lowest part, but decreasing upwards, to receive the *malleolus externus*, or lower extremity of the fibula.

Fig. II. Represents the leg raised up, to shew the situation of the under splint, when properly applied.

Fig. III. Represents a fractured leg, when laid within the splints, according to the method I am about to recommend, having the stocking-foot (or sock) and shoe upon it: the darkest shade in this and Fig. II. being intended to shew that part of the splints within the shoe.

Fig. IV. A the upper splint. BBB the pins. C the leather loop to receive the foot-strap.

Fig. V. A many-tailed bandage, made of slips of Russia linnen, regularly increasing in length from twelve or fourteen to eighteen or twenty inches, according to the size of the leg. Each of these slips (being two inches broad) is so laid as to cover half the breadth of that which is underneath it (*viz.* one inch). Another slip, ten or twelve inches long, is sewed on the back so as to unite them all in the middle, making a bandage equally as firm as a circular one, and which

may be used without disturbing the leg. The narrowest part must be placed nearest to the heel. As the number of slips are to be lessened or increased according to the space necessary to be inclosed within them, I call this a many-tailed bandage, leaving the precise number to be determined according to the nature of the circumstances.

This has been used many years in St. Bartholomew's hospital, instead of the old eighteen-headed bandage, nevertheless, as it is not generally known, I hope this description will not be thought superfluous.

The three different sizes of splints above-mentioned will generally be sufficient; at least one or other of them may serve any leg of an adult till others can be provided.

The legs of children, as they are more round and less muscular, may be defended (nearly in the same manner) with the common wooden splints (properly bolstered), that are now made use of in St. Bartholomew's hospital; provided they are long enough to secure both articulations of the fractured bone.

When a surgeon is called to a fractured leg, at the place where the accident happened, let him lay the patient on the injured side, upon a flat surface; and raise the knee of the fractured limb towards the abdomen, bending at the same time the knee joint, so as to put the extensor muscles of the foot (which are the strongest) into a state of relaxation. He will then be enabled to replace the ends of the fractured bones, and restore them to their proper situation, without the customary strong extension of the limb; which is troublesome to the surgeon, painful to the patient, and
apt

apt to bring on tension, spasms, and inflammation of the stretched muscles.

When the ends of the fractured bone are re-placed (which may often be done even without removing the shoe or stocking), let an under splint, of the most suitable size, be applied to the fibula, or outside of the leg; and, if it does not fit exactly, let it be made to do so by adding such compresses of tow, or thick flannel, as may be necessary for that purpose. Let also the upper splint be applied on the inside of the leg, so as almost to cover the tibia, on its whole length. The straps may then be fastened upon the pins sufficiently tight to secure the whole. This done, the patient may easily be removed in a sedan chair (having the cushion so raised that the leg may hang down without resting upon the bottom); or in a coach, with the limb supported by the hand of a surgeon, so that it may yield to every motion uniformly, or altogether as it were, whilst it swings in his hand: for it matters not how great the motion of the body be, provided the points of the fractured bone are secured from being moved the one against the other.

In this manner I have carried many patients from the place of the accident, over the London pavements, to their own homes at a great distance, without their having suffered any inconvenience from the motion, even where the fractures were compound.

When the patient is brought home and put to bed, (the bed having a mattress upon it), let the stocking be removed, and the proper remedies, with the many-tailed bandage, and the above splints, applied; observing the same directions as to posture, which I have already given: *viz.* that the patient be laid on
his

his side with the broken leg undermost, the knee bent, and the thigh drawn up; instead of laying him on his back with the injured limb extended.

This posture is much more comfortable and convenient (rendering it less troublesome for the patient to ease himself, or be moved by others) and removes the foot and toes out of the way of being hurt by the weight of the bed-cloaths, so as to make a fracture-box or cradle unnecessary.

If the fracture be compound, the wound generally heals by the first intention; the great impediment (irritation) being prevented, of which I can produce many instances. Add to this, that the leg may be taken up with the whole apparatus, and the knee joint gently moved, as often as necessary, to prevent that stiffness, which always succeeds a case of this kind, and is attended with much pain and inconvenience, a long time after the leg is, otherwise, well. The patient may also be taken out of bed frequently, without pain or danger, if not very heavy or unweildy.

The under splint makes a safe and secure bed for the leg, whilst the upper part is dressing (if a compound fracture); and the leg may, by a steady hand, be supported also against the upper splint, and put into any posture that may be necessary to dress a sore on the fibula, or under part.

I do not always remove the shoe and stocking-foot; as well, because they serve to keep the part in perspiration, as, that the shoe adds steadiness to the limb, by the connection it may have to the inferior part of the instrument. Both the splints are, designedly, made narrow, to leave room for examination of the parts affected; lest any undue pressure should
occasion

occasion pain : but, if it should be objected, that they are not sufficiently broad for a thick leg, that inconvenience may be remedied by putting a slip of pasteboard, or thin wood, between them on the fore-part of the leg, if thought necessary. The straps of the instrument are sufficient to secure the whole.

I made, with my own hand, the first of these instruments of strong pasteboard with iron plates rivetted upon them ; which succeeded very well. I have tried also various materials for the same purpose, such as strong hide leather, hardened with glew ; also wood, and plate-copper ; any one of which will answer sufficiently, if well formed : nevertheless I shall prefer the pasteboard, if *made strong enough*, till I can meet with a workman, that will make them, accurately, of harder materials.

The same posture, that is recommended for broken legs, I have found equally serviceable with respect to broken thighs ; and for the same reason : in which case the common wooden splint is as good as any other, provided it be long enough to secure both extremities of the fractured bone.

I have, through the whole of this description, made use of the terms upper and under splints, for the sake of being more easily understood : though perhaps the calling the one *tibiale*, and the other *fibularium*, would serve to distinguish them better, and give a more precise idea of the manner of their application ; the first being placed so as to cover a great part of the tibia, and the second forming a safe bed for the fibula.

Received